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(54) **SYSTEM AND METHOD FOR CREATING A BILLING RECORD WITH A CALLED PARTY'S NAME**

(75) Inventors: **William Konrad Wardin**, Barrington, IL (US); **Melanie Louise Murphy**, Oak Park, IL (US)

(73) Assignee: **SBC Properties, L.P.**, Reno, NV (US)

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This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

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(51) **Int. Cl.**[7] **H04M 15/00**; H04M 11/00

(52) **U.S. Cl.** **379/112.01**; 379/114.03; 379/116; 379/119; 379/121.05; 379/126; 455/406

(58) **Field of Search** 379/111, 112.01, 379/114.01, 114.05, 114.03, 114.28, 115.01, 115.02, 116, 119, 121.04, 121.05, 126, 135, 142.01, 142.04, 142.06, 142.1, 142.15, 201.01, 201.02, 201.11, 207.02; 455/405, 406, 407, 408

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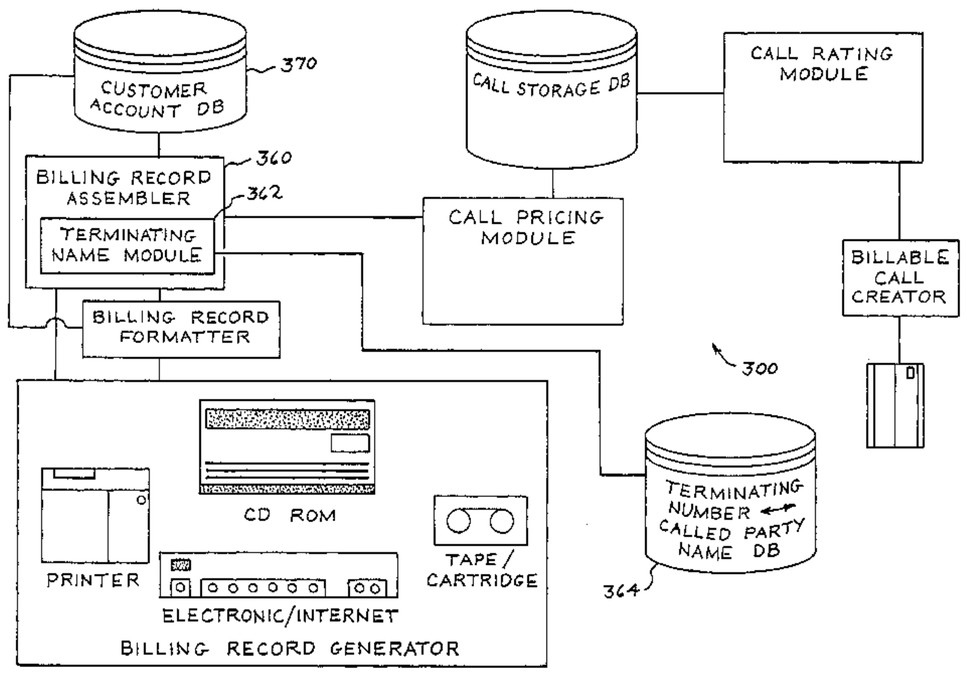
Primary Examiner—Quoc Tran
(74) *Attorney, Agent, or Firm*—Brinks Hofer Gilson & Lione

(57) **ABSTRACT**

A method and system are provided for creating a billing record with a called party's name. Providing the called party's name on the billing record facilitates the calling party's review of the billing record by reducing the amount of time and effort needed to determine the identity of the called parties. In addition to identifying fraudulent and misbilled calls, the called party's name allows a person reviewing the billing record to quickly identify long distance calls, quickly discern business from personal calls, and audit calls made from phone lines with multiple users (e.g., employees or kids). Additionally, the billing record reviewer saves time and money by avoiding the need to call directory assistance or a billing service to identify the calls.

5 Claims, 7 Drawing Sheets



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6,459,779	B2 *	10/2002	Wardin et al.	379/112.01

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XYZ Local Service

Local Toll

No.	Date	Time	Place Called	Number	Code	Min	
1	5-30	1255A	MUNCIE IN LEE'S PAINT	765 555-4500	N	2	.15
2	6-01	508P	CICERO IN PEARSON, D	317 555-9508	E	7	.92
3	6-01	658p	MUNCIE IN KOHL,K	765 555-7500	E	1	.16
4	6-02	1131P	MUNCIE IN KOHL,K	765 555-7500	N	19	2.69
5	6-03	852A	MUNCIE IN JOHNSON,R	765 555-5200	O	1	.20
6	6-03	209P	MUNCIE IN LEE'S PAINT	765 555-4500	O	11	1.98
7	6-03	223P	CANTON IN NOVACK, T	317 555-9501	D	45	5.04
8	6-07	735P	FAIRLAND IN JACOBSEN,P	765 555-1551	E	18	2.90
9	6-08	912P	MUNCIE IN	765 555-5200	N	16	2.18
Total Local Toll							16.22

Long Distance

No.	Date	Time	Place Called	Number	Code	Min	
SMITH CLGE							
1	5-30	1255A	GREEN BAY WI	414 555-4500	N	2	.15
2	6-03	209P	GREEN BAY WI	414 555-4500	D	11	1.98
3	6-07	735P	GREEN BAY WI	414 555-4500	E	18	2.90
Total Calls to SMITH CLGE							5.03
PEARSON,D							
4	6-01	508P	ST PAUL MN	612 555-8505	E	7	.92
5	6-01	658P	ST PAUL MN	612 555 9508	E	1	.18
Total Calls to PEARSON,D.							1.08
KOHL, K							
6	6-02	1131P	AKRON OH	440 555-7500	N	19	2.69
7	6-03	223P	AKRON OH	440 555-7500	D	45	5.04
Total for Calls to KOHL, K.							7.73
JOHNSON, R.							
8	6-03	852P	DULUTH MN	218 555-5200	D	1	.20
9	6-08	912P	DULUTH MN	218 555-5200	N	16	2.18
Total for Calls to JOHNSON, R.							2.38
Total Long Distance							16.22

100

Fig. 1

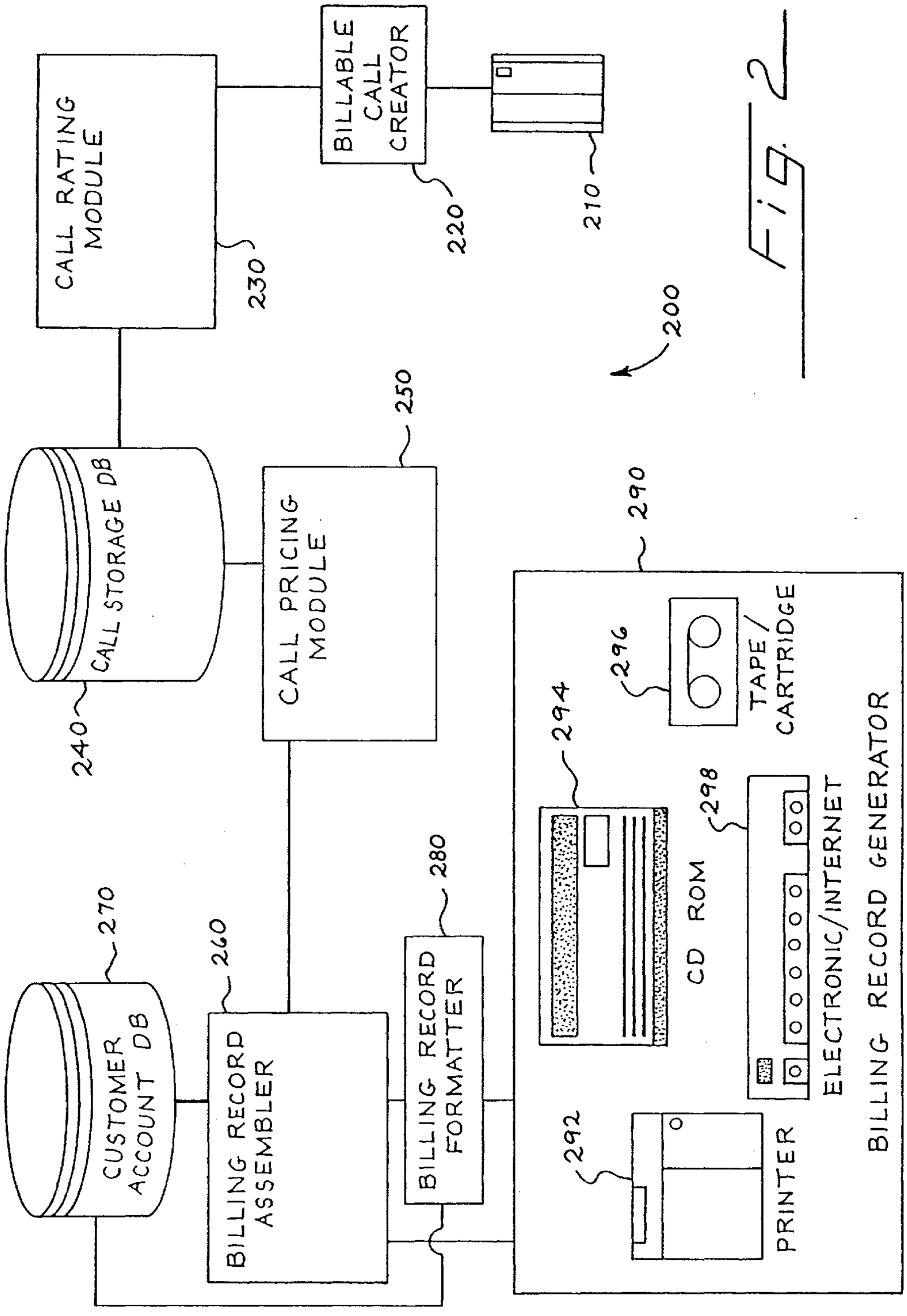
CALL RATING MODULE
230
BILLABLE CALL CREATOR
220
210
200
CALL STORAGE DB
240
CALL PRICING MODULE
250
290
294
296
TAPE / CARTRIDGE
CD ROM
298
ELECTRONIC/INTERNET
BILLING RECORD GENERATOR
280
270
CUSTOMER ACCOUNT DB
260
BILLING RECORD ASSEMBLER
BILLING RECORD FORMATTER
292
PRINTER

Fig. 2

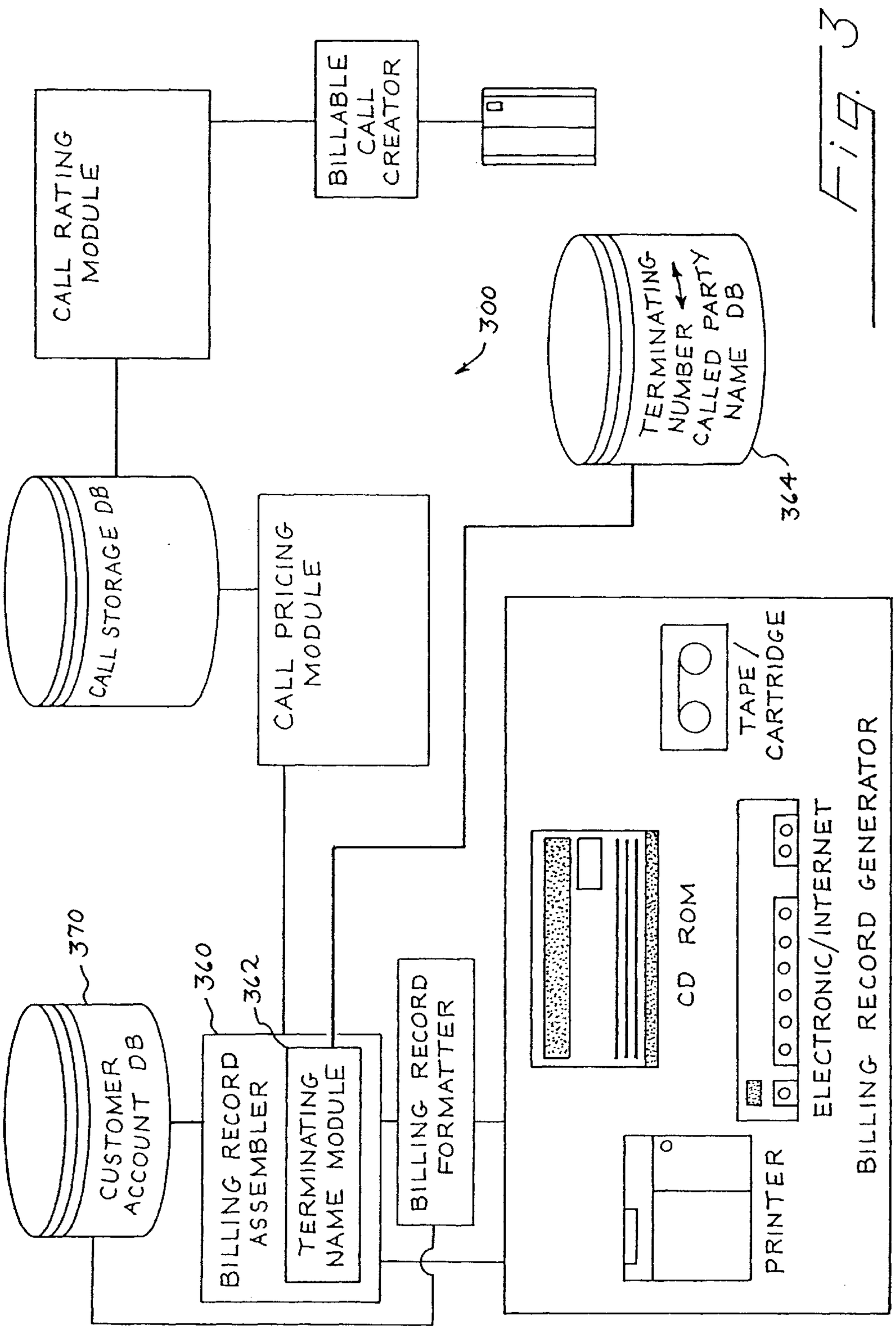
CALL RATING MODULE
BILLABLE CALL CREATOR
300
TERMINATING NUMBER ↔ CALLED PARTY NAME DB
364
CALL STORAGE DB
CALL PRICING MODULE
TAPE / CARTRIDGE
CD ROM
ELECTRONIC/INTERNET
BILLING RECORD GENERATOR
370
360
362
CUSTOMER ACCOUNT DB
BILLING RECORD ASSEMBLER
TERMINATING NAME MODULE
BILLING RECORD FORMATTER
PRINTER

Fig. 3

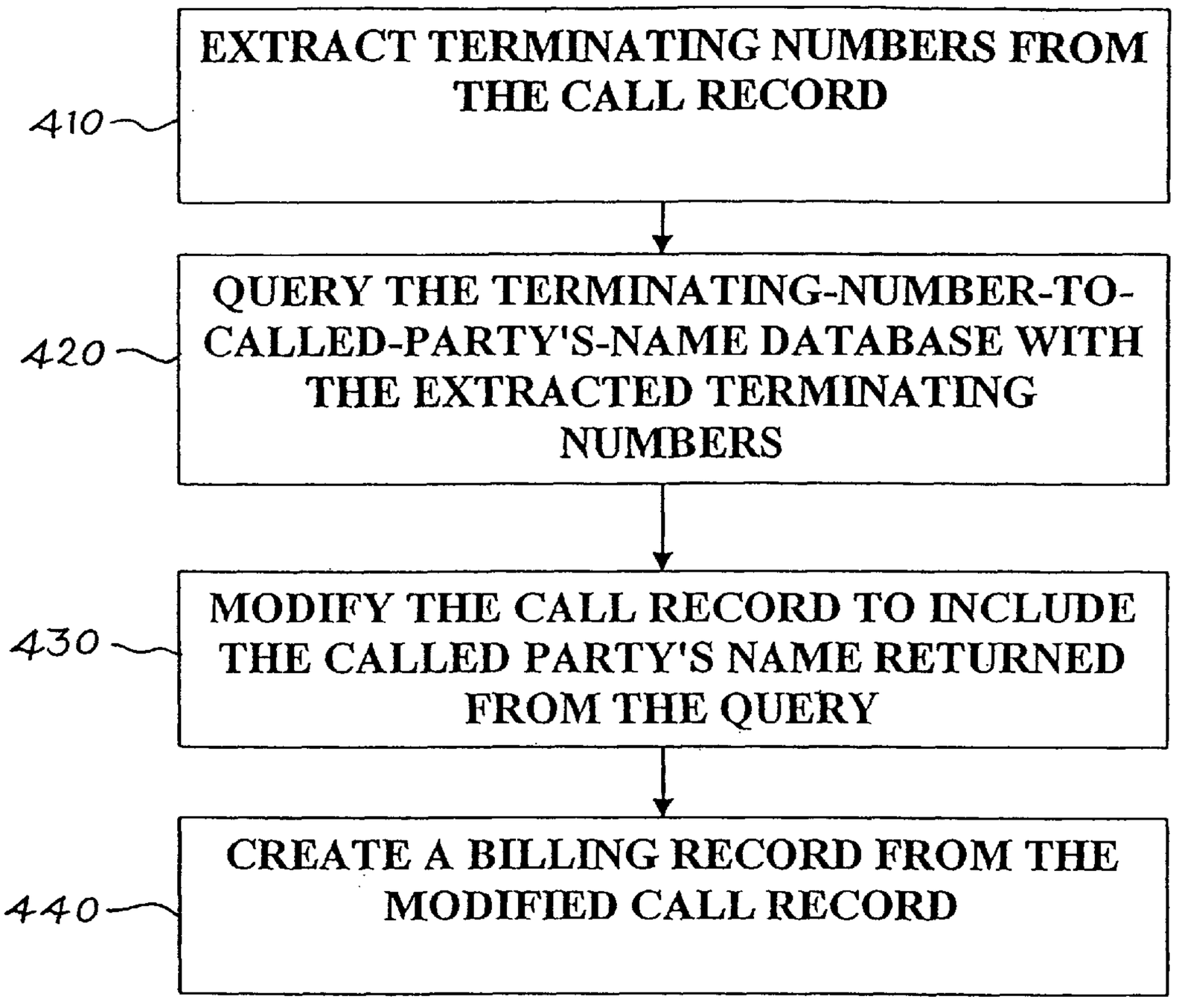
EXTRACT TERMINATING NUMBERS FROM THE CALL RECORD
410
QUERY THE TERMINATING-NUMBER-TO-CALLED-PARTY'S-NAME DATABASE WITH THE EXTRACTED TERMINATING NUMBERS
420
MODIFY THE CALL RECORD TO INCLUDE THE CALLED PARTY'S NAME RETURNED FROM THE QUERY
430
CREATE A BILLING RECORD FROM THE MODIFIED CALL RECORD
440

Fig. 4

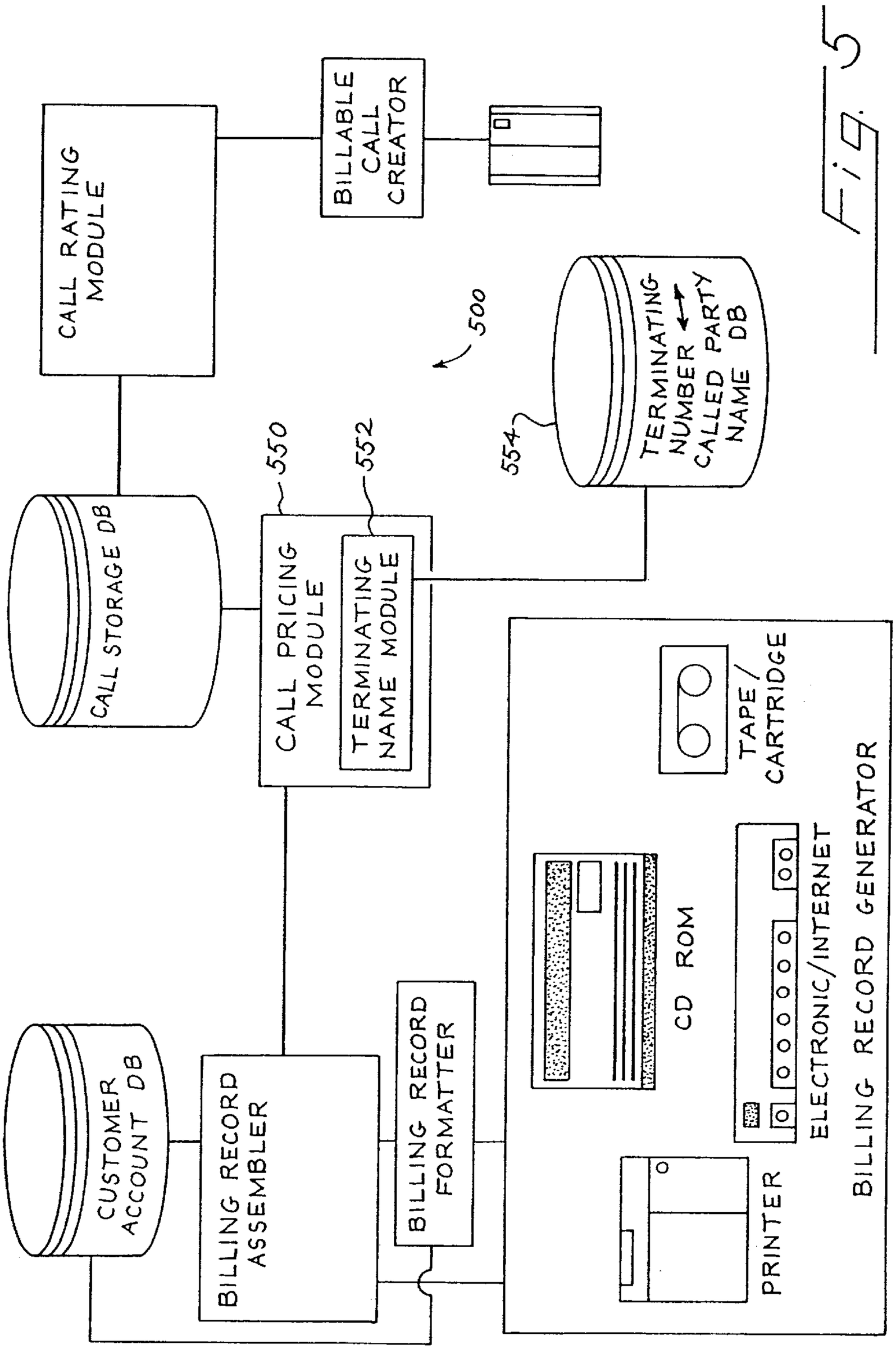
CALL RATING MODULE
BILLABLE CALL CREATOR
500
550
552
554
TERMINATING NUMBER ↔ CALLED PARTY NAME DB
CALL STORAGE DB
CALL PRICING MODULE
TERMINATING NAME MODULE
TAPE / CARTRIDGE
CD ROM
ELECTRONIC/INTERNET
PRINTER
BILLING RECORD GENERATOR
CUSTOMER ACCOUNT DB
BILLING RECORD ASSEMBLER
BILLING RECORD FORMATTER

Fig. 5

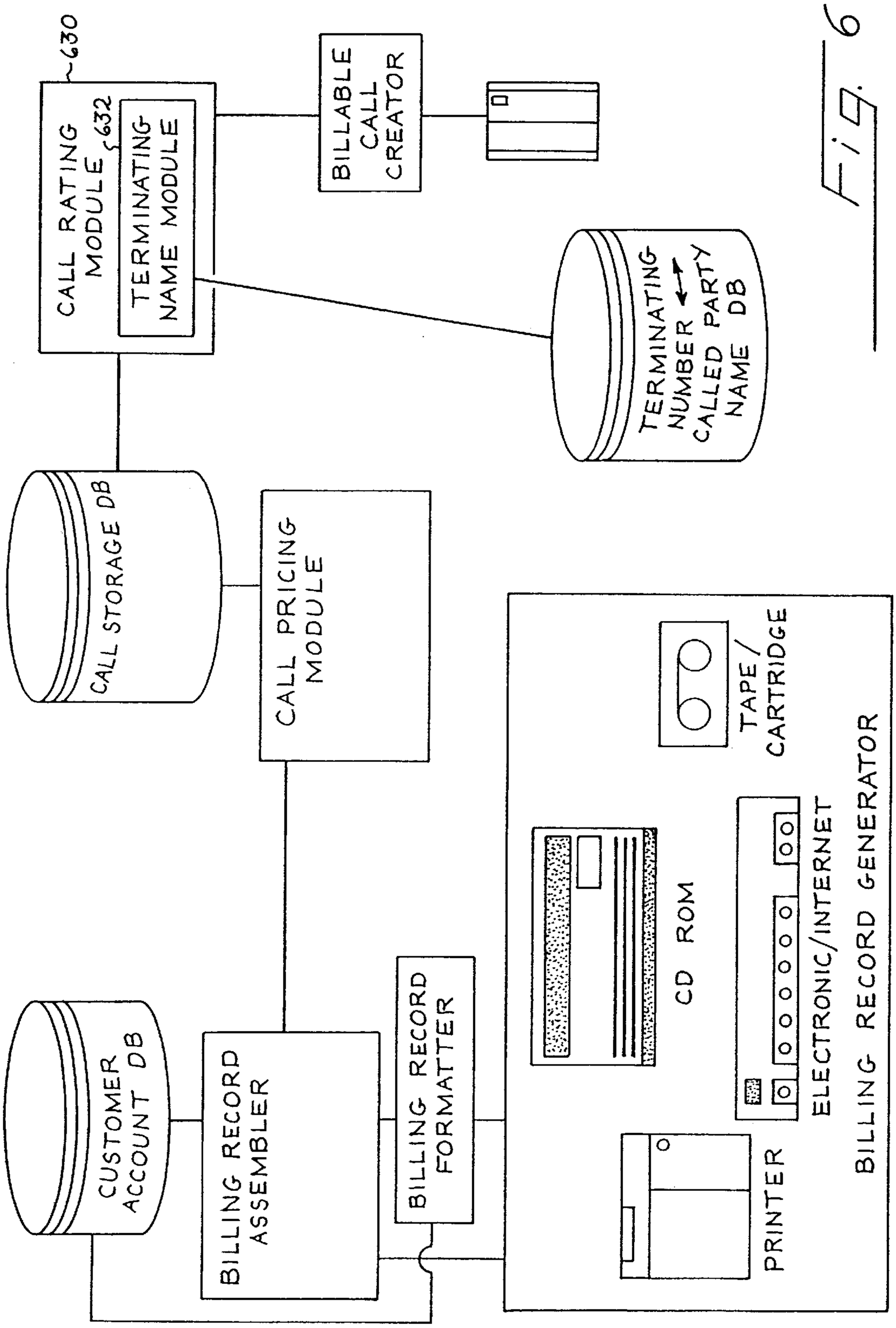
630
CALL RATING MODULE
632
TERMINATING NAME MODULE
BILLABLE CALL CREATOR
TERMINATING NUMBER ↔ CALLED PARTY NAME DB
CALL STORAGE DB
CALL PRICING MODULE
CUSTOMER ACCOUNT DB
BILLING RECORD ASSEMBLER
BILLING RECORD FORMATTER
TAPE / CARTRIDGE
CD ROM
ELECTRONIC/INTERNET
PRINTER
BILLING RECORD GENERATOR

Fig. 6

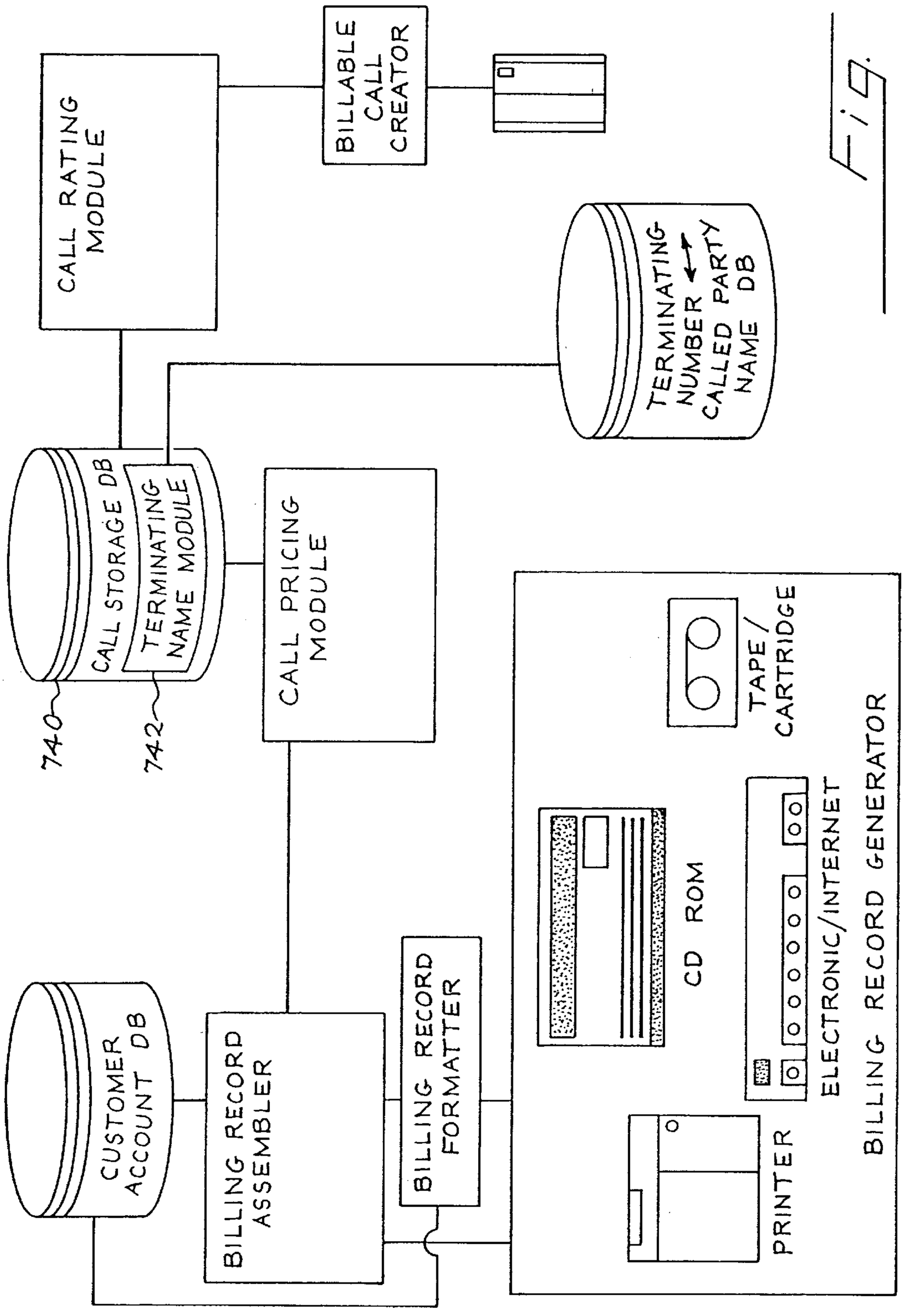
CALL RATING MODULE
BILLABLE CALL CREATOR
TERMINATING NUMBER ↔ CALLED PARTY NAME DB
CALL STORAGE DB
TERMINATING NAME MODULE
740
742
CALL PRICING MODULE
CUSTOMER ACCOUNT DB
BILLING RECORD ASSEMBLER
BILLING RECORD FORMATTER
TAPE / CARTRIDGE
CD ROM
ELECTRONIC/INTERNET
PRINTER
BILLING RECORD GENERATOR

Fig. 7

SYSTEM AND METHOD FOR CREATING A BILLING RECORD WITH A CALLED PARTY'S NAME

This application is a continuation of application No. 09/148,935, filed Sep. 4, 1998, now U.S. Pat. No. 6,459,779, which is hereby incorporated by reference.

TECHNICAL FIELD

The present invention relates generally to the creation of billing records and specifically to a system and method for creating a billing record with a called party's name.

BACKGROUND

Billing records (i.e., telephone bills) often provide the geographic location and telephone number of a person called by a calling party ("a called party"). Because it can be difficult to determine the identity of the called party based on geographic location and telephone number alone, the calling party often resorts to the time-consuming task of contacting directory assistance or his billing service to identify the calls. Determining the identity of the called party based on geographic location and telephone number is made even more difficult when a called party subscribes to a number portability service, which allows a called party to retain the same telephone number even when he moves to a different geographic location. With such a service, the area code listed on the billing record may not correspond with the geographic location listed on the billing record.

There is, therefore, a need for an improved billing system and method that will overcome the disadvantages discussed above.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an illustration of a presently preferred printed billing record showing the names of called parties.

FIG. **2** is a block diagram of a billing record generation system of a presently preferred embodiment.

FIG. **3** is a block diagram of a system of a preferred embodiment for creating a billing record with a called party's name.

FIG. **4** is a flow chart of a preferred method of creating a billing record with a called party's name using the preferred system of FIG. **3**.

FIG. **5** is a block diagram of system of another preferred embodiment for creating a billing record with a called party's name.

FIG. **6** is a block diagram of a system of another preferred embodiment for creating a billing record with a called party's name.

FIG. **7** is a block diagram of a system of another preferred embodiment for creating a billing record with a called party's name.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

By way of introduction, the preferred embodiments described below include a system and method for creating a billing record, such as the billing record **100** shown in FIG. **1**, with a called party's name. Providing the called party's name on the billing record facilitates the calling party's review of the billing record by reducing the amount of time and effort needed to determine the identity of the called parties. In addition to identifying fraudulent and misbilled calls, the called party's name allows a person reviewing the billing record to quickly identify long distance calls, quickly discern business from personal calls, and audit calls made from phone lines with multiple users (e.g., employees or kids). Additionally, the billing record reviewer saves time and money by avoiding the need to call directory assistance or a billing service to identify the calls.

Turning again to the drawings, FIG. **2** is a block diagram of a billing record generation system **200** of a presently preferred embodiment. As shown in FIG. **2**, this system **200** comprises a public switch **210**, a billable call creator **220**, a call rating module **230**, a call storage database **240**, a call pricing module **250**, a billing record assembler **260**, a customer account database **270**, a billing record formatter **280**, and a billing record generator **290**. The billing record generator **290** can comprise, for example, a printer **292**, a CD-ROM drive **294**, a tape/cartridge deck **296**, and/or a data network interface **298**.

In operation, the public switch **210** (i.e., the telephone network) delivers a call record detailing the calls associated with the public switch **210** to a billing system. This is done after call processing, after the call is complete, and during the billing process in the billing system. The first component of the billing system is the billable call creator **220**, which edits the call record to remove those call that will not be billed. For example, the billable call creator **220** can remove information about calls that were attempted but not terminated. The edited call record is then sent to the call rating module **230**, which rates the calls and includes the rating information in the call record. The call record is then stored in the call storage database **240**. It is preferred that the call record be provided by the public switch **210** and edited, rated, and stored on a daily basis.

At a given time, call records for individual calling parties are extracted from the call storage database **240**, and the calls are priced by the call pricing module **250**. Preferably, this takes place at the end of the billing period (e.g., at the end of a month) in order to apply volume discounts that are calculated at the end of the billing period. The call record is then sent from the call pricing module **250** to the billing record assembler **260**, which combines the call record with information from the customer account database **270** to assemble a billing record for the calling party. The information from the customer account database **270** can include, for example, recurring monthly charges, non-recurring charges, credits, adjustments, current balance, previous balance, payments, and usage.

After the billing record is assembled, the billing record formatter **280** places the assembled billing record into a format specified by the customer account database **270**. For example, the customer account database **270** can instruct the billing record formatter **280** to sort the calls in a particular order and to generate the billing record in an electronic or hard-copy form. The formatted billing record is then sent to the billing record generator **290**, which prints a hard copy of the billing record using the printer **292**. In addition to or as an alternative to a printed billing record, an electronic copy of the billing record can be provided to the calling party with, for example, the CD-ROM drive **294**, the tape/cartridge deck **296**, and/or the data network interface **298**.

FIG. **3** is a block diagram of a system **300** of a preferred embodiment for creating a billing record with a called party's name. This system **300** is identical to the system **200** of FIG. **2** but further includes a terminating name module **362** coupled with a terminating-number-to-called-party's-name database **364**. Preferably, the terminating-number-to-

called-party's-name database **364** comprises a national and/or international directory assistance database. As used herein, the term "coupled with" means directly coupled with or indirectly coupled with through one or more components. As described in more detail below, the terminating name module **362** can extract a terminating number from the call record. In this preferred embodiment, the terminating name module **362** is part of the billing record assembler **360**. If a calling party subscribes to the called-party's-name-on-bill service, the customer account database **370** sends a trigger to the terminating name module **362** in the billing record assembler **360** to determine the name of the called party associated the terminating number.

FIG. **4** is a flow chart of a preferred method of creating a billing record with a called party's name using the preferred system **300** of FIG. **3**. As is apparent from the foregoing description, this method preferably takes places after a call is complete. First, the terminating name module **362** extracts terminating numbers from the call record (step **410**). The terminating name module **362** can then determine which of the terminating numbers, if any, are eligible for the called-party's-name-on-bill service, as described below. Next, the terminating name module **362** queries the terminating-number-to-called-party's-name database **364** with the extracted terminating numbers to perform a reverse directory-assistance look-up (step **420**). It is preferred that the terminating name module **362** sort the extracted terminating numbers to query only one instance of a given terminating number. The terminating name module **362** then modifies the call record to include the called party's name returned from the query (step **430**). If the extracted terminating numbers were sorted so only one query per instance of a given terminating number was sent, it is preferred that the returned called party name be added to every occurrence of the terminating number in the call record. The modified call record is then passed to the other parts of the billing system, where a hard or electronic copy of the billing record can eventually be generated (step **440**).

If the terminating-number-to-called-party's-name database **364** that is coupled with the terminating name module **362** does not contain the called party's name, the terminating name module **362** ("the first terminating name module") can transfer the query to another terminating name module ("the second terminating name module") coupled with a database that does contain the information. In this situation, it is preferred that the first terminating name module place the terminating number in a message format in accordance with the Electronic Directory Assistance ("EDA") Standard Interface Specification Version 1.1, dated Oct. 16, 1997 and send the message to the second terminating name module. The second terminating name module then converts the EDA protocol into the protocol required by the database and performs the query. After the database returns a response to the query, the second terminating name module converts the database protocol back into the EDA protocol and sends the response to the first terminating name module, which extracts the called party's name from the EDA protocol and modifies the call record, as described above.

In the system **300** of FIG. **3**, the terminating name module **362** is part of the billing record assembler **360**. The terminating name module can, however, be implemented in other parts of the billing system, and the eligible terminating numbers can be extracted from the call record that is present in that part of the system. For example, FIG. **5** shows a billing system **500** in which the terminating name module **552** is part of the call pricing module **550**. By being part of the call pricing module **550**, the terminating name module **552** can extract eligible terminating numbers from the call record present in the call pricing module **550** and can query the terminating-number-to-called-party's-name database **554** to determine the called party's name during pricing when volume discounts, calling plans, and usage summaries are being calculated. In other alternatives, the terminating name module **632**, **742** can be part of the call rating module **630** (as shown in FIG. **6**) or the call storage database **740** (as shown in FIG. **7**), and the eligible terminating numbers can be extracted from the call record in the call rating module **630** and call storage database **740**, respectively. Since adding the called party's name to the call record may lengthen the call record, several components of the billing system may need to be modified accordingly. To introduce the least amount of intrusion into the billing system, it is preferred that the terminating name module be part of the billing record assembler, as shown in FIG. **3**. Further, by being part of the billing record assembler, the terminating name module would be more response to those customers who activate or de-activate the service in the middle of a billing cycle (i.e., mid-month).

In the preferred embodiments described above, the call record was modified to include the called party name. To ensure that the call record is the same length before and after the modification, the called party's name can replace one of the fields (e.g., geographic location) already present in the call record. Alternatively, the called party's name can be added to the call record to create a more informative billing record. For example, providing the called party's name with the geographic location information can be particularly helpful when the called party's name is not available in the database or if the response from the database is inaccurate. Adding additional information to the call record may require altering some parts of the billing system to accepted the longer call record.

As described above, the terminating name module can select which terminating numbers are eligible for the called-party's-name-on-bill service, thereby making the billing system more efficient. For example, the terminating name module can exclude those numbers that are already identifiable to a phone user, such as those for directory assistance, voice-message services, information provider services (e.g., 900 and 976 services), and conference-call set-up calls. If a particular telephone company only has access to a national directory assistance database, international numbers can be excluded from the terminating name module. If a particular telephone company only has access to a national directory assistance database, it is preferred that only the call types shown in Table 1 be sent to the terminating name module.

TABLE 1

010101	Message Telephone Service Charge
010105	800 service (Recorded at Originating Location)
010107	Non-Dial Conference Leg
010109	Billable Conference Leg Charge
011010	Picture Phone Charge
010112	Person/Collect announcement Charge
010125	800 Service
010131	Local
010133	Mobile Channel usage charge
010134	Messenger Service Charge
010135	Verification Service Charge
010137	Interrupt Service Charge
010180	Marine/Aircraft/High-Speed Train Toll Charge
010181	Marine/Aircraft/High-Speed Train Radio link Charge
010182	Marine Non-Dial Conference Leg

The call types shown in Table 1 refer to call types described in the document "Bellcore Standard Exchange Message Records" (Document Number BR 010-200-010). Of the call types listed in Table 1, it is preferred that only

those calls with a settlement code number or a value of J in position 149 (the "settlement code" position) of the exchange message record be sent. It is preferred that the data used to query the database be the data stored in position 30–39 (the "to number"). If a value of 2 (collect) is stored in position 80 ("the call message type"), it is preferred that the data stored in position 15–24 (the "from number") be used. Position 15–24 (the "from number") is also preferably used for call types 010105 and 010125.

For simplicity, the terms "terminating name module", "billing record assembler", "call pricing module", "call rating module", "billable call creator", and "billing record formatter" are used in the specification and claims to broadly refer to hardware and/or software that can be used to perform the functions described above. It is important to note that any appropriate software language and any appropriate hardware, analog or digital, now in existence or later developed, can be used. Examples of hardware that can be programmed to perform the above-described functions include IBM Series Numbers 9672 and 9021 and RISC-6000 systems. A computer-usable medium having computer readable program code embodied therein can be used to perform the functions described above, and the functions described above can alternatively be implemented exclusively with hardware. Additionally, the functionality associated with each element can be combined with or distributed to other elements. Also, some of the elements described above may not be needed in all embodiments.

It is intended that the foregoing detailed description be understood as an illustration of selected forms that the invention can take and not as a definition of the invention. It is only following claims, including all the equivalents, that are intended to define the scope of this invention.

What is claimed is:

1. A method for creating a billing record with a called party's-name, the method comprising:

(a) sending a call record from a switch to a billing record generation system; wherein the call record comprises a plurality of terminating numbers;

(b) querying a database with the terminating numbers from the call record;

(c) modifying the call record by adding a called party's name returned from the query of (b) to the call record; and

(d) creating a billing record from the modified call record, whereby the billing record comprises the called party's name;

wherein (b)–(d) are performed by the billing record generation system.

2. The invention of claim **1**, wherein (c) is performed after call processing.

3. The invention of claim **1**, wherein the call record comprises at least one number that is not associated with an information provider service.

4. The invention of claim **1**, wherein the switch comprises a public switch.

5. The invention of claim **1**, wherein the switch is part of a telephone network, and wherein the billing record generation system is separate from the telephone network.

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